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Summary or abstract of presentation (max 1000 words)

Surgical management of left displaced abomasum in dairy cattle: A critically appraised topic (CAT)

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Evidence-based veterinary medicine (EBVM) can be defined as using the most reliable and relevant available scientific evidence in conjunction with clinical expertise to make the most appropriate decision about a veterinary patient, while considering the circumstances of each patient and its owner. One method of evidence synthesis underpinning EBVM is through the creation of critically appraised topics (CATs), where a clinically relevant question arising in practice is identified and the current literature is searched and appraised in order to form an evidence-based 'clinical bottom line' with which to help base decisions (Arlt and others 2012, Feters and others 2014, Steele and others 2013). This paper presents a CAT investigating surgical management of left displaced abomasum (LDA) developed by students and staff at the University of Bristol which will soon be published in the Veterinary Record's Clinical Decision Making section.

LDA in dairy cows is a common diagnosis for cattle practitioners, with an average annual incidence reported to range from 1-5%, with some farms exceeding 15% (Cameron and others 1998, Gröhn and others 1998, Shaver and others 1997). Clinicians have several treatment options at their disposal, and often there are several factors involved in decision making. This CAT examines a specific clinical question: **Which surgical technique to correct LDA has the fastest clinical recovery rate, right-sided omentopexy or laparoscopy-guided abomasopexy?**

A three-part patient question was constructed and, from this, Boolean search terms were defined. Two literature databases were searched: Medline on Web of Science interface and CAB abstracts on Ovid SP interface. A total of 18 papers were found: nine papers were duplicates and six were considered irrelevant as they did not answer the clinical

question. This left three papers for critical appraisal (Roy and others 2008, Seeger and others 2006, Wittek and others 2009).

Summary of Evidence

The three papers appraised had patient groups ranging from 30-253 lactating dairy cows diagnosed with LDA. Two studies were randomised controlled trials, and one was a non-randomised controlled trial. None of the studies were blinded. Outcomes measured across the studies included: rumen contraction rate, abomasal emptying rate, daily milk yield, appetite, comfort, ketosis, recurrence rates and complication rates. Some of these outcomes were quantitatively measured, while others were subjectively measured and therefore more prone to observer bias.

Two of the studies showed statistically significant differences between the recovery outcomes measured, with laparoscopy-guided abomasopexy showing significantly increased rumen contraction rate ($p < 0.05$) and abomasal emptying rate ($p < 0.05$) compared to right-sided omentopexy. One study found a significant increase ($p < 0.001$) in daily energy intake and a significant increase in daily milk yield ($p = 0.003$) in the five days post-surgery for laparoscopy-guided abomasopexy, while the other two studies found no significant difference in milk yield, and one study also showed no significant difference in appetite or cow comfort.

Critical appraisal of these studies identified several weaknesses in the evidence. None of the studies had been blinded when assessing outcomes, and were therefore open to bias. One of the studies did not randomly allocate patients to treatment groups, and that same study found a statistical difference in the number of cows presenting with concurrent ketosis at the time of surgery between groups. Given the known effects of ketosis on appetite and milk yield, this is likely to have confounded the results.

The papers reviewed agree that both techniques are clinically viable options in treating LDA. Although Roy and others (2008) had the largest sample size, it was judged to be the weakest study included, as the outcomes measured were subjective and minimal attempts were made to reduce bias. Seeger and others (2006) provided the strongest evidence to answer the clinical question due to the larger sample size, quantitative outcome measures and longer-term measurement.

These studies highlight that it is prudent to consider a range of factors when choosing a treatment, such as cost, surgeon experience, surgery time and the magnitude and likelihood of post-operative complications. When considering purely the rate of recovery, laparoscopic abomasopexy is superior to right flank omentopexy, although the evidence so far is weak.

Clinical bottom line

Treatment of cows with LDA via laparoscopy-guided abomasopexy produces a faster recovery than right-sided omentopexy.

There is an obvious paucity of evidence in this area, and what evidence there is available is weak. Further research is needed to improve the strength of evidence available to clinicians.

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